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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/827,118	04/19/2004	Michael P.C. Watts	P102-44-03	1452

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EXAMINER
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STAICOVICI, STEFAN

ART UNIT	PAPER NUMBER
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1732

DATE MAILED: 12/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/827,118

Applicant(s)

WATTS ET AL.

Examiner

Stefan Staicovici

Art Unit

1732

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-14 and 17-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-14 and 17-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Response to Amendment*

1. Applicants' amendment filed October 14, 2005 has been entered. Claims 1-3, 5-14 and 17-36 are pending in the instant application.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2, 4-12, 14, 18-21, 23-31, 33 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson *et al.* (US Patent No. 6,334,960 B1).

Regarding claims 1-2, 5-8, 11, 14, 18-21, 23-27, 29-31 and 33, Wilson *et al.* ('960) teach the basic claimed process for forming a pattern on a plate including, providing a mold (40) made from a quartz (material that is transparent to radiation) and having a relief pattern, providing a substrate (10) (plate) having a polycarbonate transfer layer (20) (coupling agent) thereon, said transfer layer having an excellent adhesion to actinic radiation (infrared or ultraviolet) polymerizable material such as, epoxy, polycarbonate or silicone based, that is positioned between said mold (40) and said transfer layer (20). Further, Wilson *et al.* ('960) teach placing said polymerizable material between said mold and said substrate (plate), transferring said pattern from said mold onto said polymerizable material by closing the gap between said mold

and said substrate such that said polymerizable material comes into contact with said mold and said substrate, polymerizing said polymerizable material by applying UV (actinic) radiation through said mold to impinge on said polymerizable material and bonding said polymerized material to said transfer layer (coupling agent) by solidifying said polymerizable material and creating a chemical bond in order for bonding to occur (see col. 2, line 53 through col. 4, line 63 and Figures 1A-1D). It is noted that whether radiation travels through said mold to impinge on said polymerizable material or through said substrate (plate) and said transfer layer to impinge on said polymerizable layer does not appear to have unexpected results because both the mold and the support are transparent to actinic radiation. Hence, it would have been obvious for one of ordinary skill in the art to have redirected the actinic radiation through said substrate (plate) and said transfer layer to impinge on said polymerizable layer in the process of Wilson *et al.* ('960) because both the mold and the support are transparent to actinic radiation and as such both are equivalent alternatives depending on a variety of factors such as cost, ease of operation, etc. Furthermore, it is noted that Wilson *et al.* ('960) teach that said pattern has an aspect ratio of 0.1-10, wherein the width is about 10nm-5000 $\mu$ m. Hence, it is submitted that the height of the pattern is about 1 nm-500  $\mu$ m.

Further regarding claims 1 and 14 and, in regard to claim 7, Wilson *et al.* ('960) teach that said support is made from gallium arsenide (see col. 3, lines 10-11). It is submitted that gallium arsenide is transparent to actinic radiation, specifically infrared radiation.

Regarding claims 12, 28 and 31, although Wilson *et al.* ('960) teach that the substrate is made from plastics and silicone, Wilson *et al.* ('960) do not teach that the substrate is made from

a radiation transparent material, such as, quartz. However, Wilson *et al.* ('960) teach that the mold is made from quartz. Further, Wilson *et al.* ('960) teach that the material used for making the mold and the substrate may be optimized according to the needs of one ordinarily skilled in the art. Hence, it is submitted that the material is a result-effective variable. Therefore, it would have been obvious for one of ordinary skill in the art to have used routine optimization to determine the material for making the substrate in the process of Wilson *et al.* ('960) because Wilson *et al.* ('960) teach that the material used for making the mold and the substrate may be optimized according to the needs of one ordinarily skilled in the art, hence teaching that the mold and substrate material is a result-effective variable and also because quartz is radiation transparent. Furthermore, it is noted that Wilson *et al.* ('960) teach that said support is made from gallium arsenide (see col. 3, lines 10-11), hence it is submitted that gallium arsenide is transparent to actinic radiation, specifically infrared radiation.

In regard to claim 36, Wilson *et al.* ('960) teach an additional thermal treatment (see col. 4, lines 45-65).

4. Claims 3, 13, 17, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson *et al.* (US Patent No. 6,334,960 B1) in view of Bailey *et al.* (US 2002/0115002).

Wilson *et al.* ('960) teach the basic claimed process as described above.

Regarding claims 3, 13, 17, 22, Wilson *et al.* ('960) does not teach depositing the polymerizable material in the form of droplets. Bailey *et al.* (US 2002/0115002) teaches a fluid dispensing method of a polymerizable material in an imprint lithographic process including, forming a pattern of drops between a mold and a support (see paragraph [0126]). Therefore, it

would have been obvious for one of ordinary skill in the art to have provided a pattern of drops of a polymerizable material as taught by Bailey *et al.* (US 2002/0115002) in the process of Wilson *et al.* ('960) because, Bailey *et al.* (US 2002/0115002) teaches that such a pattern of droplets provides for a faster dispensing step, hence reducing production time and as such, reducing costs.

5. Claims 32 and 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson *et al.* (US Patent No. 6,334,960 B1) in view of Chen *et al.* (US Patent No. 6,852,358 B1).

Wilson *et al.* ('960) teach the basic claimed process as described above.

Regarding claims 32 and 34-35, although Wilson *et al.* ('960) teach a polymeric transfer layer (coupling agent), Wilson *et al.* ('960) do not specifically teach a silicone coupling agent, specifically 3-trimethoxysilylpropyl acrylate. However, the use of 3-trimethoxysilylpropyl acrylate as a coupling agent in imprint lithography is well known as evidenced by Chen *et al.* ('358) who teach the use of 3-trimethoxysilylpropyl acrylate as a coupling agent in imprint lithography. Therefore, it would have been obvious for one of ordinary skill in the art to have provided 3-trimethoxysilylpropyl acrylate as taught by Chen *et al.* ('358) as a transfer layer (coupling agent) in the process of Wilson *et al.* ('960) because, Chen *et al.* ('358) teach the use of 3-trimethoxysilylpropyl acrylate as a coupling agent in imprint lithography, whereas Wilson *et al.* ('960) teach an imprint lithography process, hence requiring the teachings of Chen *et al.* ('358) in order to function as described and also because, silicone coupling agents are a mere equivalent to the thermoplastic and thermosetting coupling materials taught by Wilson *et al.* ('960) (see col. 3, lines 8-23).

*Response to Arguments*

6. Applicants' arguments filed October 14, 2005 have been considered.

7. Applicants argue that Wilson *et al.* ('960) "does not teach passing radiation through a layer positioned on a body, with the radiation adhering a formable material to the layer," but "teaches passing radiation through a body that is transparent to allow exposure of the radiation to a polymerizable fluid" and as such, Applicants further argue that "Wilson teaches away from Applicants' claimed invention of adhering the formable material to the layer by advocating release of formable material from the body" (see page 14 of the amendment filed 10/14/05). In response, it is noted that:

(a) the claimed invention teaches passing radiation through a backing plate and a body (coupling agent) to impinge on a formable material such as to adhere said formable material to said body (coupling agent);

(b) Wilson *et al.* ('960) teaches passing radiation through a mold to impinge on a polymerizable material (formable material) and a transfer layer such as to adhere said polymerizable material (formable material) to said transfer layer (coupling agent).

Hence, it is submitted that the difference between the claimed invention and the teachings of Wilson *et al.* ('960) is the direction in which the radiation travels. As such, in Figure 1A of Wilson *et al.* ('960), if the radiation travels through the support (10), the said radiation then passes through the transfer layer (coupling agent) and adheres said polymerizable material (formable material) to said transfer layer (coupling agent). Therefore, whether radiation travels through said mold to impinge on said polymerizable material or through said substrate (plate)

and said transfer layer to impinge on said polymerizable layer does not appear to have unexpected results because both the mold and the support are transparent to actinic radiation. Specifically, Wilson *et al.* ('960) teach that said mold is made from quartz and said support is made from gallium arsenide, both materials being transparent to actinic radiation. Furthermore, it is noted that under MPEP §2144.04(VI)(A), a mere reversal of direction without more is an obvious expedient.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

### ***Conclusion***


9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (571) 272-1208. The examiner can normally be reached on Monday-Friday 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael P. Colaianni, can be reached on (571) 272-1196. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stefan Staicovici, PhD

  
Primary Examiner 12/24/05

AU 1732

December 22, 2005